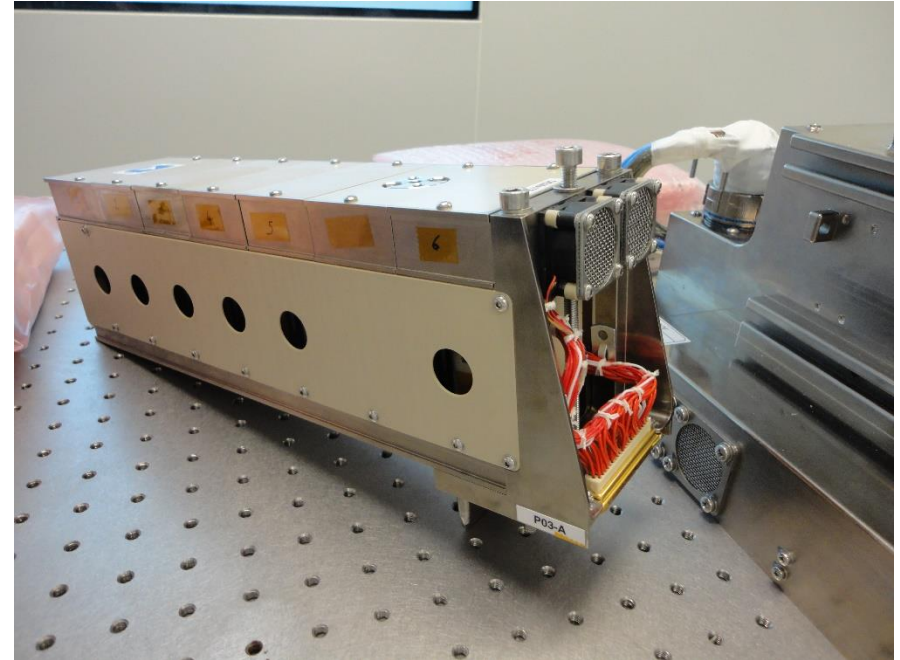
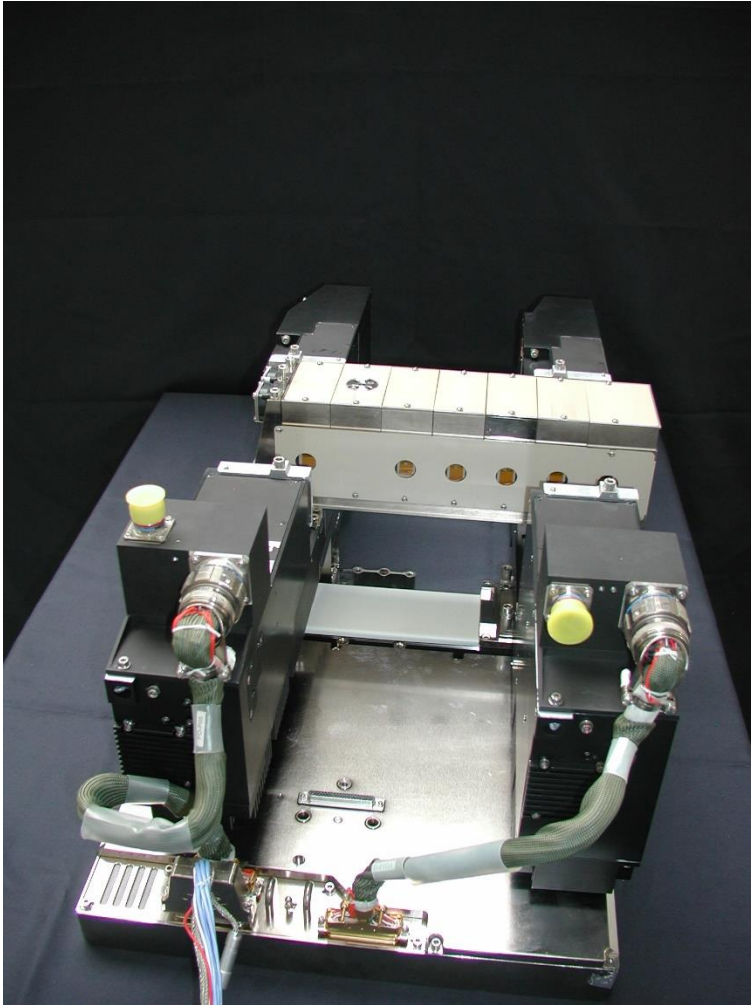


SODI-DCMIX3 Operations

José Miguel Ezquerro Navarro, E-USOC, UPM

POIWG face-to-face meeting #40

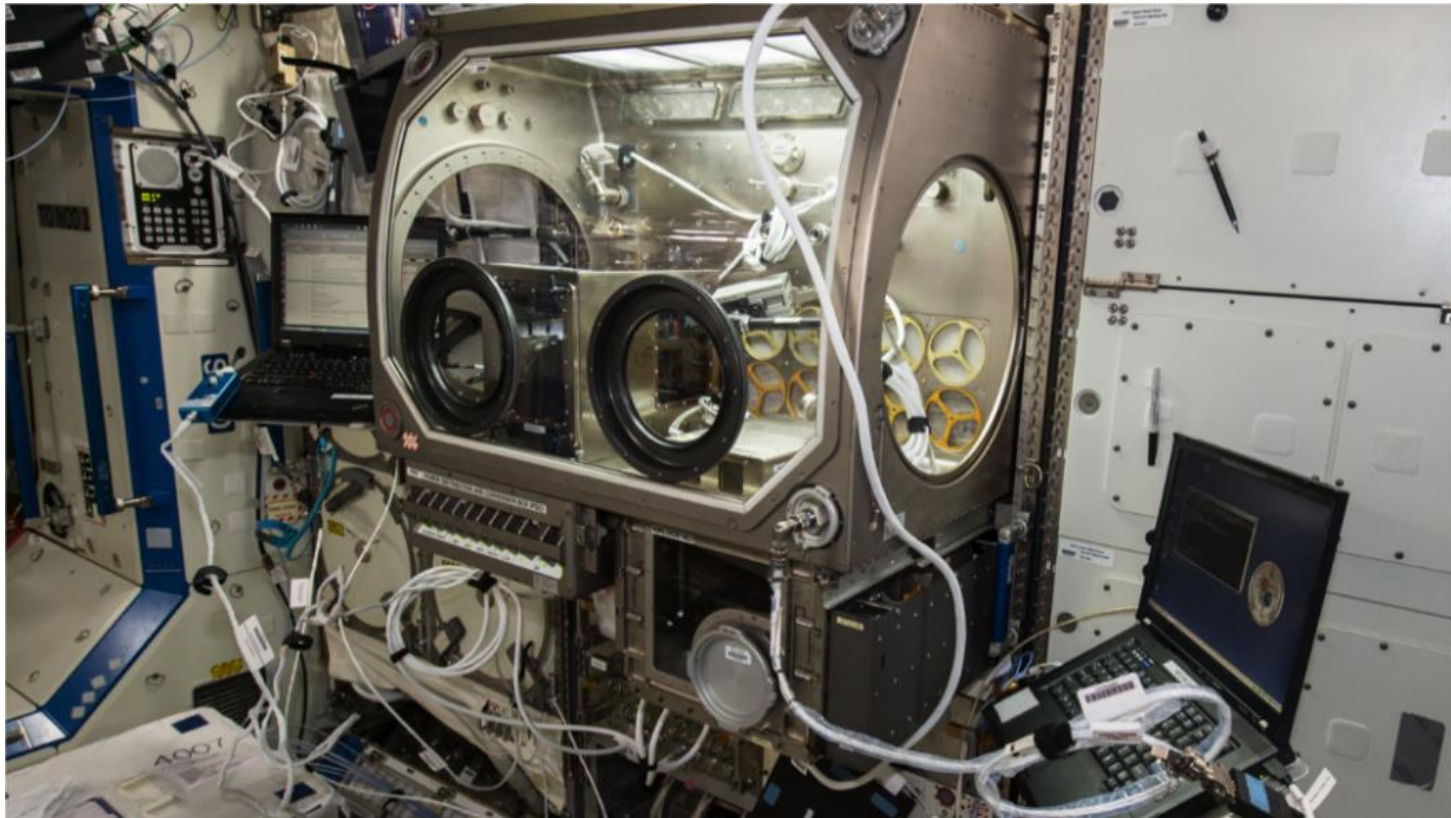
SODI DCMIX3: Overview



Study of Soret and Diffusion coefficients:
how the concentration in different liquids
containing water, ethanol and triethylene-
glycol varies under a thermal gradient.

SODI DCMIX3: Overview

- Experiment performed in MSG.



SODI DCMIX3 in Orb3

- SODI DCMIX3 – Orb-3 (October 2014)



SODI DCMIX3 in Orb3



SODI DCMIX3 in Inc. 49&50

- Current flight baseline:
 - Launch in Spx-9 – 18 July 2016
 - Start of ops 26 September 2016 after OsteOmics
 - End of ops 11 November 2016 before MESC

- Flash disks return in Spx-10



DCMIX3 Science

	Nominal	Nice-to-have	Total
Operations duration (weeks)	7	4	11
Number of science runs	20	5	25
Hours per run	22	41	N/A
Compressed data (GB)	233	127	360
Number of 256-GB Flash Disks needed	1	1	2
Near r/t downlink (GB)	21	9	30

DCMIX3 Operations

	Activity	GND / Crew	Time
1	HW setup (SODI + DCMIX3 CA in MSG)	Crew	4:20 h
2	Checkout and calibration	GND	5 days
3	Science runs	GND	8 / 12 weeks
4	Flash Disk exchange if needed	Crew	0:15 h
5	Data backup in the EHD (640 GB)	GND + crew (EHD connection)	1-2 days ground 0:10 h crew
6	HW stowage	Crew	2:55 h
7	FDs preparation for return	Crew	0:30 h

DCMIX3 Operations

- 24/5 ops
 - 3rd shift monitoring by PRO
 - MSG powered on continuously
 - SODI powered on continuously
 - » Avoids thermalisation times: 20 hours after each power up
- Nominal ground commanding:
 - ASW update, DCMIX3 checkout and calibration (SODI)
 - SODI reboot and initialization (SODI)
 - Script and files control (SODI)
 - Files **uplink/downlink/compression** (SODI and **MSG OPS**)
 - **SODI power on/off (MSG OPS)**
 - **Data backup (MSG OPS)**

DCMIX3 Operations

Crew required for	Time
SODI DCMIX setup	4:20 hrs
SODI DCMIX stow	2:55 hrs
Data backup	0:10 hrs
FDs preparation for return	0:30 hrs
Total nominal science	7:55 hrs
FD Exchange for nice-to-have runs	0:15 hrs
Total nominal + nice-to-have science	8:10 hrs

Challenges

- Flights schedule
 - Ops duration
- Cell array lifetime
 - >6 months
- Images quality → optical checkout
 - Starting point: DCMIX2 configuration (verified in the EM with the new fluids).

Readiness

- All operations products were prepared for Orb3
- Minor updates for Inc. 49&50:
 - Implementation of OCR changes withdrawn due to Orb3 mishap
 - Crew procedures:
 - » new HW items
 - » OCR changes implementation
 - Planning
- Uplink files ready since Orb3 (no updates)

Thank you

Backup slides: Acronyms

ASW	Application Software
CA	Cell Array
DCMIX	Diffusion Coefficients in ternary Mixtures
ECR	Engineering Change Request
EHD	External Hard Disk
EM	Engineering Model
E-USOC	Spanish User Support and Operations Centre
FD	Flash Disk
GCP	Ground Command Procedure
GND	Ground
HW	Hardware
MLC	MSG Laptop Computer
MSG	Microgravity Science Glovebox
OCR	Operations Change Request
P/L	Payload
R/T	Real time
SODI	Selectable Optical Diagnostics Instrument

Backup slides: DCMIX3 calendar

Week 3 (26SEP-02OCT 2016)																						
	Mon 26th Sep / DOY 270			Tue 27th Sep / DOY 271			Wed 28th Sep / DOY 272			Thu 29th Sep / DOY 273			Fri 30th Sep / DOY 274			Sat 1st Oct / DOY 275			Sun 2nd Oct / DOY 276			
Shifts	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00	
Major Events	<div>SODI SETUP</div>																					
SODI-DCMIX				Systems and Optical Checkout with Cell Array																		
MSG A/D																						
UPLINK																						
On orbit data																						

Week 4 (30CT-9OCT 2016)																					
	Mon 3rd Oct / DOY 277			Tue 4th Oct / DOY 278			Wed 5th Oct / DOY 279			Thu 6th Oct / DOY 280			Fri 7th Oct / DOY 281			Sat 8th Oct / DOY 282			Sun 9th Oct / DOY 283		
Shifts	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00
Major Events											HTVE Dock										
SODI-DCMIX	Run 1			Run 2			Run 3			Run 4			Run 5								
MSG A/D																					
UPLINK																					
On orbit data																					

	Week 5 (10OCT-16OCT 2016)																				
	Mon 10th Oct / DOY 284			Tue 11th Oct / DOY 285			Wed 12th Oct / DOY 286			Thu 13th Oct / DOY 287			Fri 14th Oct / DOY 288			Sat 15th Oct / DOY 289			Sun 16th Oct / DOY 290		
Shifts	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00
Major Events	USA holiday						Spanish holiday														
SODI-DCMIX				Run 6			Run 7			Run 8			Compression / Downlink								
MSG A/D																					
UPLINK																					
On orbit data																					

Week 6 (17OCT-23OCT 2016)																					
	Mon 17th Oct / DOY 291			Tue 18th Oct / DOY 292			Wed 19th Oct / DOY 293			Thu 20th Oct / DOY 294			Fri 21st Oct / DOY 295			Sat 22nd Oct / DOY 296			Sun 23rd Oct / DOY 297		
Shifts	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00
Major Events											63P Dock										
SODI-DCMIX	Run 9			Run 10			Run 11			Run 12			Run 13								
MSG A/D																					
UPLINK																					
On orbit data																					

Backup slides: DCMIX3 calendar

Week 7 (24OCT-30OCT 2016)																		
	Mon 24th Oct / DOY 298			Tue 25th Oct / DOY 299			Wed 26th Oct / DOY 300			Thu 27th Oct / DOY 301			Fri 28th Oct / DOY 302			Sat 29th Oct / DOY 303		
Shifts	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00
Major Events																		
SODI-DCMIX	Run 14			Run 15			Run 16			Run 17			Run 18					
MSG A/D																		
UPLINK																		
On orbit data																		


Week 8 (31OCT-06NOV 2016)																		
	Mon 31st Oct / DOY 305			Tue 1st Nov / DOY 306			Wed 2nd Nov / DOY 307			Thu 3rd Nov / DOY 308			Fri 4th Nov / DOY 309			Sat 5th Nov / DOY 310		
Shifts	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00
Major Events		EHD setup		Spanish holiday														
SODI-DCMIX	Compression / Downlink						Run 19			Compress	Run 20			Compress				
MSG A/D																		
UPLINK																		
On orbit data																		


Week 9 (07NOV-13NOV 2016)																		
	Mon 7th Nov / DOY 312			Tue 8th Nov / DOY 313			Wed 9th Nov / DOY 314			Thu 10th Nov / DOY 315			Fri 11th Nov / DOY 316			Sat 12th Nov / DOY 317		
Shifts	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00	6:00	14:00	22:00
Major Events							Spanish holiday							SODI STOW				
SODI-DCMIX	Compression / Downlink						Data Backup disk 1											
MSG A/D																		
UPLINK																		
On orbit data																		


IMPORTANT NOTE


Science runs not interrupted due to ISS events (e. g. vehicle docking, re-boosting etc.)


COLOR CODE


 Crew Activity


 SODI Checkout Activity

 FD 1 Scientific Run

 FD 2 Scientific Run

 No runs due to ISS Event

 MSG On, SODI On

 MSG Off, SODI Off

 MSG On (optional Off), SODI Off

 Uplink Activities

 Run aborted

Backup slides: MSG utilization schedule

